

NATIONAL RESEARCH COUNCIL
COMMISSION ON PHYSICAL SCIENCES, MATHEMATICS, AND APPLICATIONS
2101 Constitution Avenue Washington, D.C. 20418

BOARD ON
PHYSICS AND ASTRONOMY

(202) 334-3520
FAX: (202) 334-2791
INTERNET: BPA@NAS.EDU

May 13, 1996

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Mr. William F. Caton
Secretary
Federal Communications Commission
Room 222
1919 M Street, N.W.
Washington, D.C. 20554

Re: ET Docket No. 96-2

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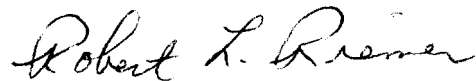
In the Matter of
Amendment of the Commission's Rules
to Establish a Radio Astronomy
Coordination Zone in Puerto Rico

Dear Mr. Caton:

Transmitted herewith by the National Academy of Sciences, through the Committee on Radio Frequencies of the National Research Council, are an original and nine (9) copies of its Motion for Leave to File and Reply Comments in the above-referenced proceedings.

If additional information is required concerning this matter, please communicate with this office.

Sincerely yours,



Robert L. Riemer
Senior Program Officer

Enclosure

cc: Members of CORF
Mr. Paul J. Feldman
Dr. Donald C. Shapero

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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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OFFICE OF SECRETARY

In the Matter of)
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Amendment of the Commission's) ET Docket No. 96-2
Rules to Establish a)
Radio Astronomy)
Coordination Zone)
in Puerto Rico)

MOTION FOR LEAVE TO FILE
AND REPLY COMMENTS OF THE
NATIONAL ACADEMY OF SCIENCES'
COMMITTEE ON RADIO FREQUENCIES

The National Academy of Sciences, through the National Research Council's Committee on Radio Frequencies (hereinafter, CORF), hereby submits its Reply Comments in response to the Commission's Notice of Proposed Rulemaking, FCC 96-12, released February 8, 1996 in the above-captioned proceeding (the Notice).^{1,2}

¹The CORF Chair, Dr. Michael Davis, is an employee of the National Astronomy and Ionosphere Center at Arecibo and has recused himself from the preparation of these Reply Comments.

²CORF hereby moves for leave to file these Reply Comments after the filing deadline. CORF is a volunteer committee of experts whose filings must be submitted to review by the National Research Council, and it was not able to prepare these Reply Comments in the allotted time. This late filing will not prejudice any parties, since these Reply Comments address issues only in the original Comments filed in this proceeding (not Reply Comments), and no delay is created to other parties, since there is no further opportunity for responsive pleadings in this proceeding. Furthermore, CORF believes that this delay will not substantially affect the progress of this proceeding. Most importantly, CORF believes that these Reply Comments contain arguments that address the concerns of other Commenters, which will contribute to reasoned decisionmaking in this proceeding.

In its Comments in this proceeding, CORF strongly supported the Commission's proposal to establish a coordination zone requiring applicants for new or modified facilities in various communications services to provide written notification of their proposed operations to the Arecibo Observatory in Arecibo, Puerto Rico (the Observatory). CORF notes that the Commission's proposal drew no objections from representatives of most of the services to be affected by the proposal. In these Reply Comments, CORF addresses some of the objections raised by a few Commenters.

I. ENACTMENT OF THE COORDINATION ZONE
SERVES THE PUBLIC INTEREST.

CORF believes that a substantial case has been built in this proceeding demonstrating the need for and value of the proposed Coordination Zone. No Commenter has contested the unique and important nature of the work performed at the Observatory or the damaging impact on that work of spurious and out-of-band emissions. Furthermore, as demonstrated in CORF's Comments and those of Cornell University, the Observatory has spent substantial amounts of time and millions of dollars to protect its facilities from spurious emissions. The proposed Coordination Zone would only require those users to exert a minimal effort to notify and a reasonable effort to coordinate their own proposed facilities with the existing operations of the Observatory.

The Puerto Rico Telephone Company (PRTC) (Comments at pages 4-5) and the Asociacion de Radiodifusores de Puerto Rico (PRBA) (Comments at page 3) suggest that there is no need for a Coordination Zone, since applications for new or modified stations are regularly published in the Commission's Public Notices. There are two reasons why reviewing such Notices is clearly insufficient to protect the Observatory from spurious emissions. First, many services do not require applications to be filed prior to commencement of service or using the spectrum. See, e.g., Section 22.165(d) of the Commission's Rules (paging licensees may construct "fill-in" facilities without filing applications). Second, even where applications are required and are put on Public Notice, while such Notices may be sufficient to alert in-band users of potential interference (e.g., broadcast station to broadcast station), the publication of merely the frequency and name of the applicant in Notices for many services does not provide information sufficient to evaluate whether a proposed facility could cause spurious emissions to the Observatory. Coordinates, power, terrain elevation at the proposed transmitter site, and antenna directivity and gain are the minimum information required in every service in order to evaluate potential impact on the Observatory.

Contrary to the assertions of PRTC (Comments at pages 3-4) and Celpage, Inc. (Comments at page 13), the need for the Coordination Zone is not negated by Commonwealth of Puerto Rico regulations that limit emissions within a four-mile radius of the Observatory. While

reduction in spurious emissions resulting from those regulations is helpful, it is hardly sufficient to protect the Observatory. For example, a 1-milliwatt spurious signal at 1420 MHz originating at a facility 100 kilometers from the Observatory would require at least 55 dB of terrain shielding towards the Observatory (in addition to spreading losses) in order to bring it below the harmful power-flux-density limit given in ITU-R RA.769 of -196 dB W/m^2 . It is obvious that harmful spurious emissions can and regularly do originate from facilities at distances greater than four miles from the Observatory.

Similarly, the Commission's proposal does not give unfettered discretion to the Observatory (Comments of PRBA at page 3) or constitute a delegation of Commission power to the Observatory. As proposed in paragraph 21 of the Notice, if the Observatory and an applicant disagree regarding the potential for interference or the reasonableness of a proposed solution, the matter is resolved by the Commission.

Lastly, CORF does not concur with the assertion of PRTC (Comments at pages 11-12) and Celpage (Comments at page 10) that the Coordination Zone process will substantially delay the introduction of radio services in Puerto Rico. When properly functioning, the Coordination Zone process should prevent the need (if it were to arise) for the Observatory to file a petition to deny against a particular application. It is the Petition process, not coordination, that could lead to substantial delays in service.

II. SPECIFIC CRITERIA IN THE RULES FOR LEVELS OF HARMFUL INTERFERENCE AND FOR WHAT CONSTITUTES REASONABLE EFFORTS FOR TECHNICAL MODIFICATIONS ARE NOT NECESSARY OR HELPFUL.

In its Comments in this proceeding, CORF noted that numerous factors can influence the level of emissions that constitute harmful interference. CORF noted that while ITU-R RA.769 defines the specific levels of harmful interference for frequencies allocated to radio astronomy and both ITU-R RA.769 and ITU TG 1/3 could provide some criteria to be used, ultimately a single standard may not be useful at this time. CORF therefore believes the best approach would be to allow some flexibility in the process, as both the Observatory and other users gain experience in the coordination process. Some Commenters have expressed concern that, without more specific standards, it will be difficult to design facilities to minimize impact on the Observatory (Comments of the Society of Broadcast Engineers (SBE) at page 3). CORF recognizes the validity of this concern and believes that SBE's proposed solution (interference criteria published by the Observatory but not placed in the Commission's rules) addresses both the practical concerns of radio operators and the need for flexible development of harmful interference criteria as technologies change and as all parties gain experience in coordination. If any party believed that the published standards were unreasonable, that party could refuse to comply and allow the Commission to resolve the matter.

Similarly, some Commenters have expressed concern that the Notice does not specifically define the "reasonable efforts" that a party would have to make in accommodating the Observatory if it is determined that the party's proposal would likely cause harmful interference to the Observatory. See, e.g., Comments of SBE at page 3 and of PRTC at pages 7-11. In its original Comments, CORF noted that in most cases, filtering and case-shielding are cost-efficient and effective means of reducing harmful emissions. Similarly, eliminating nonlinearities, revising antenna patterns, and using terrain shielding (where possible) may, under certain circumstances, be additional obvious candidates for "reasonable technical modifications."

Given that every case is likely to be different, however, it is probably impossible to create an effective and practical rule that gives exhaustive detailed criteria for "reasonable efforts" or "reasonable technical modifications." Such a rule could list, as examples, filtering, case-shielding, revising antenna patterns, and using terrain shielding, etc. If the Commission believes it to be necessary, CORF would support the inclusion of such examples in a rule, if it were made explicit that the list was not exclusive or exhaustive.³ However, CORF asserts that it is not necessary as a

³If the Commission were to enact a rule whereby the Observatory publishes written criteria for harmful interference, such a rule would comply with the requirements of the Administrative Procedure Act. 5 U.S.C. 553(b)(3) requires that notices contain "either the terms or substance of the proposed rule or a description of the subjects and issues involved." The Notice more than complied with the requirement to "describe" the issue of interference standards: while paragraph 27

practical matter to make the term "reasonable" more specific in the rules. If necessary, the Commission can resolve the reasonableness of a proposal on a case-by-case basis.

Furthermore, it is not necessary as a matter of administrative procedure to include specific criteria for "reasonable efforts" or "reasonable technical modifications" in the Coordination Zone rules. Indeed, it is common for Commission rules mandating resolution of interference between parties to require "reasonable" accommodation of another party's facilities, without listing more specific requirements. See, e.g.,

- Section 21.31(a) (in processing MDS applications, FCC expects "full cooperation in good faith by all applicants or parties to achieve reasonable technical adjustments which would avoid electrical conflict.");
- Section 24.431(a) (in processing PCS applications, FCC expects "full cooperation in good faith by all applicants or parties to achieve reasonable technical adjustments which would avoid electrical conflict.");
- Section 25.274(e) (an earth station licensee whose operations are suspected of causing interference "shall take reasonable measures to determine whether its operations are the source of the harmful interference problem...[and] shall take all measures necessary to eliminate the interference.");
- Section 73.685(d) (television stations causing "blanketing" interference must "assume full responsibility for the adjustment

suggests that the Commission would not adopt specific criteria, it requests comments on the alternative of establishing such specific criteria. Commenters were thus on alert that specific criteria could be adopted, and, indeed, PRTC and SBE advocated for specific criteria. The Commission is allowed to use comments in a rulemaking proceeding to alter its proposed rules. See, e.g., *Spartan Radiocasting Co. v. FCC*, 619 F.2d 314,322 (4th Cir. 1980)

of reasonable complaints arising from excessively strong signals of the applicant's station or take corrective action.").

See also Sections 73.687(e)(3) and 90.403(e).

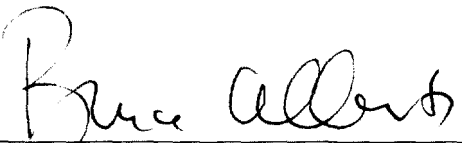
III. CONCLUSION

The proposed Coordination Zone will serve the public interest by protecting valuable and unique radio astronomy research conducted at the Observatory, without impact on the authorized frequencies of any radio operators. Coordination will impose only minimal burdens on radio operators and will not substantially delay the provision of services to the citizens of Puerto Rico.

Respectfully submitted,

NATIONAL ACADEMY OF SCIENCES'
COMMITTEE ON RADIO FREQUENCIES

By:



Bruce Alberts
President

May 13, 1996

Direct correspondence to:
Dr. Robert L. Riemer
HA-562
National Research Council
2101 Constitution Ave., NW
Washington, DC 20418
(202) 334-3520

CERTIFICATE OF SERVICE

I, Robert L. Riemer, hereby certify that on this 13th day of May, 1996, copies of the attached Reply Comments of the National Academy of Sciences' Committee on Radio Frequencies were deposited with the U.S. Postal Service, first class postage prepaid, addressed to the following:

Richard Rubin
Steven N. Teplitz
Fleischman and Walsh, L.L.P.
1400 Sixteenth Street, N.W.
Sixth Floor
Washington, DC 20036

Jay L. Birnbaum
David H. Pawlik
Skadden, Arps, Slate, Meagher
& Flom
1440 New York Ave., N.W.
Washington, DC 20005

Carl Heiles
University of California,
Berkeley
Berkeley Astronomy Dept.
Leuschner Observatory
Berkeley, CA 94720-3411

Victor Madera
P.R./V.I. Volunteer Frequency
Coordinators Inc.
P.O. Box 475
Mayaguez, PR 00681-0475

Christopher J. Reynolds
Reynolds & Manning, P.A.
P.O. Box 2809
Prince Frederick, MD 20678

Christopher D. Imlay
Booth, Freret & Imlay
1233 20th St. N.W., Suite 204
Washington, DC 20036

Dr. Neal Lane
National Science Foundation
4201 Wilson Blvd.
Arlington, VA 22230

Paul A. Vanden Bout
National Radio Astronomy
Observatory
520 Edgemont Road
Charlottesville, VA 22903-2475

Bernard A. Solnik
Leventhal, Senter & Lerman
2000 K Street, N.W.
Suite 600
Washington, DC 20006

Francisco R. Montero
Asociacion de Radiodifusores
De Puerto Rico
Fisher Wayland Cooper, et al.
2001 Pennsylvania Ave., N.W.,
Suite 400
Washington, DC 20006

Joe D. Edge
Mark F. Dever
Drinker Biddle & Reath
901 15th St., N.W.
Washington, DC 20005

Francisco R. Montero, Esq.
Stephen J. Berman, Esq.
Fisher Wayland Cooper Leader &
Zaragoza, L.L.P.
2001 Pennsylvania Ave., N.W.
Suite 400
Washington, DC 20006

Frederick M. Joyce, Esq.
Christine McLaughlin, Esq.
Joyce & Jacobs
Attorneys at Law, LLP
1019 19th St., N.W.
14th Floor, PH-2
Washington, DC 20036

Norman P. Leventhal, Esq.
Bernard A. Solnik
Leventhal, Senter & Lerman
2000 K St., N.W., Suite 600
Washington, DC 20006

John P. Huchra
Center for Astrophysics
60 Garden Street
Cambridge, MA 02138

Dr. Angel Roman
Estado Libre Asociado de
Puerto Rico
Gobierno Municipal de Arecibo
Oficina Del Alacalde
Apartado 1086
Arecibo, PR 00613

Morton S. Roberts
National Radio Astronomy
Observatory
520 Edgemont Road
Charlottesville, VA 22903

Bruce Balick
Astronomy Department
P.O. Box 351580
Seattle, WA 98195


John M. Dickey
University of Minnesota
Department of Astronomy
116 Church Street, S.E.
Minneapolis, MN 55455

Tomas E. Gergely
Electromagnetic Spectrum
Manager
Division of Astronomical
Sciences
National Science Foundation
4201 Wilson Blvd.
Arlington, VA 22230

Juan Luis Cuevas Castro
Estado Libre Asociado de
Puerto Rico
Gobierno Municipal de Hatillo
Oficina Del Alcalde
Hatillo, PR 00659

Dorothy Conway
Federal Communications
Commission
1919 M Street, N.W., Room 234
Washington, DC 20554

Timothy Fain
OMB Desk Officer
10236 NEOB
725 17th Street, N.W.
Washington, DC 20503


Robert L. Riemer